REMARKS

Status of the Claims

Claims 1-5, 7-14, 16-19, 21-27, 29-36, 38-45, 47-54 and 56-59 stand rejected. Claim 19 has been amended. Claim 22 has been cancelled by this amendment. No new matter has been added.

Rejections Under 35 USC § 102

Schwab in view of Lin

The Examiner has rejected claims 1, 3-5, 7-14, 16-18, 23-27, 29-36, 38-45, 47-54 and 56-59 under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 5,669,938 ("Schwab") in view of U.S. Patent No. 6,458,173 ("Lin"), for the reasons provided at pages 2-4 of the outstanding Office Action. Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143.

Independent claim 1 recites a method of reducing the amount of peroxides in middle distillate fuels blended with one or more oxygenates, the method comprising,

among other things, combining the fuel with a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group, wherein the amount of hydrocarbon additive combined with the fuel reduces the amount of peroxides in the fuel as compared with the same fuel without the hydrocarbon additive, wherein the fuel has a sulfur content of about 20 ppm or less.

With respect to claim 1, Schwab does not teach a method of reducing peroxides in middle distillate fuels. Schwab does not recognize the problem of instability caused by peroxide buildup in low sulfur fuels, nor discuss a solution for reducing peroxides.

Instead, Schwab teaches that adding peroxides to a water-in-oil fuel composition is desirable for increasing the thermal stability of the fuel composition. See Schwab, column 3, lines 58 to 63. Schwab further teaches that the base fuel employed in the composition will normally contain an amount in the range of 500 to about 50,000 and for example, from about 1,000 to about 10,000 ppm of hydrocarbyl peroxide. According to Schwab, such quantities are normally sufficient to improve the thermal stability of the fuel.

Thus, Schwab clearly does not teach a method for reducing peroxides. Rather, the teachings of Schwab that peroxides are useful for providing thermal stability would lead one of ordinary skill in the art away from reducing peroxides. Such a teaching away is strong evidence of non-obviousness. As discussed in the MPEP, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP 2141.02.

With respect to independent claims 10, 23, 32, 41, and 50, these claims recite, among other things, that the amount of peroxides in the fuel is less than about 8 ppm.

The teachings of Schwab that hydrocarbyl peroxides range from 500 to about 50,000 and for example, from about 1,000 to about 10,000 parts hydrocarbyl peroxide ppm in the base fuel appears to clearly teach away from these claims as well.

Furthermore, each of claims 1, 10, 23, 32, 41 and 50 recite that "the fuel has a sulfur content of about 20 ppm or less. The Examiner admits that no such limitation is taught by Schwab and has supplied Lin to allegedly teach this missing teaching. However, Lin does not teach reducing peroxides, as in claim 1, or peroxide concentrations in the fuel of less than about 8 ppm, as in claims 10, 23, 32, 41 and 50. Rather, Lin is directed to novel fuel additives that can act as both as detergents and as lubricity additives. Lin, Column 1, Summary.

Because the claimed hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group is not recognized by either Schwab or Lin for reducing peroxides, there is no motivation for combining the hydrocarbon additive with a low sulfur fuel to reduce peroxides. Furthermore, given the teachings of Schwab that peroxides can increase thermal stability, one of ordinary skill in the art would avoid reducing peroxides, and instead may well add peroxides to provide the desired stability. For similar reasons, there is also no evidence in either Schwab or Lin that peroxides would be reduced to the concentrations recited in claims 10, 23, 32, 41, and 50.

For at least these reasons, every limitation of the claims is not taught. Accordingly, no *prima facie* case of obviousness has been established, and the rejection should be withdrawn.

Cunningham

The Examiner has rejected claims 1, 3-5, 7-14, 16-18, 23-27, 29-36, 38-45, 47-54 and 56-59 under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 5,405,417 ("Cunningham"), for the reasons provided at pages 4-5 of the outstanding Office Action. Applicants respectfully traverse this rejection.

Independent claim 1 recites a method of reducing the amount of peroxides in middle distillate fuels blended with one or more oxygenates, the method comprising, among other things, combining the fuel with a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group, wherein the amount of hydrocarbon additive combined with the fuel reduces the amount of peroxides in the fuel as compared with the same fuel without the hydrocarbon additive, wherein the fuel has a sulfur content of about 20 ppm or less.

Cunningham teaches a fuel composition characterized in that it comprises a major proportion of a hydrocarbonaceous middle distillate fuel and a minor combustion-improving amount of at least one peroxy ester combustion improver. Column 1, lines 37-45. The fuel compositions may additionally contain a small quantity of one or more organic nitrate esters. Column 3, lines 43-45.

However, Cunningham does not teach reducing the amount of peroxides in middle distillate fuels blended with one or more oxygenates by combining the fuel with a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group, wherein the fuel has a sulfur content of about 20 ppm or less. In fact, the addition of peroxy ester combustion improvers in Cunningham, which have oxygen-oxygen single bonds and would thus be considered peroxides, teaches away

from the claimed method for reducing peroxides. See Cunningham, column 2, lines 47 to 68.

The Examiner has entirely failed to address the addition of peroxy ester combustion improvers in Cunningham, or how it can be considered that a method of reducing peroxides is taught when Cunningham specifically teaches adding a peroxide. Without such a teaching, every limitation of the claims is not taught. Accordingly, no *prima facie* case of obviousness is made, and the rejection should be withdrawn.

With respect to independent claims 10, 23, 32, 41, and 50, these claims recite, among other things, that the amount of peroxides in the fuel is less than about 8 ppm. This teaching is clearly not met by Cunningham, given the specific addition of a peroxy ester to the compositions of Cunningham.

According to the Examiner, it would be reasonable to expect that the peroxide content of the fuel compositions of Cunningham would be reduced to less than about 8 ppm because Cunningham teaches low sulfur fuels and an oxygenate and hydrocarbon additive, similar to the claims of the present application. However, this reasoning is clearly flawed because the additive of Cunningham is a peroxide.

For at least these reasons, Cunningham fails to teach or suggest every limitation of the claims. Accordingly, no *prima facie* case of obviousness has been established, and the rejection should be withdrawn.

Yeh

The Examiner has rejected claims 1-5, 7, 8, 10-14, 16, 17, 19, 21, 23-27, 29, 30, 32-36, 38, 39, 41-45, 47, 48, 59-54, 56, 57 and 59 are rejected under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 6,447,557 ("Yeh"), for the reasons provided at

pages 5-6 of the outstanding Office Action. Applicants respectfully traverse this rejection.

Independent claim 1 recites a method of reducing the amount of peroxides in middle distillate fuels blended with one or more oxygenates, the method comprising, among other things, combining the fuel with a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group, wherein the amount of hydrocarbon additive combined with the fuel reduces the amount of peroxides in the fuel as compared with the same fuel without the hydrocarbon additive, wherein the fuel has a sulfur content of about 20 ppm or less.

With respect to claim 1, Yeh does not teach a method of reducing peroxides in middle distillate fuels. Yeh does not recognize the problem of instability caused by peroxide buildup in low sulfur fuels, nor discuss a solution for reducing peroxides. Instead, Yeh is directed to the use of specific oxygenates in low sulfur fuels for reducing particulate emissions. Yeh, Column 2, lines 59-64. Yeh teaches a fuel composition comprising a major amount of a base fuel having no more than 50 ppm by weight of sulfur; and at least 1% by weight of an oxygenate. While Yeh teaches that the oxygenate can be either an alcohol or ketone, or mixtures thereof, all of the example compositions employ either an alcohol or a ketone, rather than both. Column 3, lines 1-12; and Examples at Column 6, Table 2 and Column 7, Table 3.

Yeh teaches a variety of alcohols, including primary, secondary and tertiary alcohols, which may be straight chain alcohols, or branched chain alcohols. A long list of more than 30 specific alcohols are taught. While Yeh mentions 2-ethylhexanol as one possible option, Yeh specifically points to iso-nonanol and iso-decanol as being

particularly preferred. Column 3, line 45 to column 4, line 25, in particular Column 4, lines 23-25. In addition to the many alcohols taught, Yeh also teaches a large number of possible ketones that can be employed.

Yeh fails to teach or exemplify a sulfur content of about 20 ppm or less, as is claimed. Rather, as discussed above, Yeh generally teaches a sulfur content of no more than 50 ppm. Moreover, the example compositions employ a fuel with a composition of 31 ppm sulfur. Column 6, line 6.

Thus, Yeh literally teaches thousands of possible compositions, nearly none of which are applicants claimed composition. To arrive at applicants claimed composition from the teaching of Yeh, one or ordinary skill in the art would have to make a number of unlikely choices from among the many possible combinations, including: 1) choosing to use both an alcohol and ketone, even though Yeh specifically teaches that alcohols and ketones can be used separately, and even though all of Yeh's examples employ either an alcohol or ketone, rather than both; 2) choosing 2-ethylhexanol from among the many possible alcohols taught, even thought Yeh specifically points to iso-nonanol and iso-decanol as being particularly preferred; and 3) choosing to use a fuel having a content of 20 ppm or less, even though no such fuel is specifically taught or exemplified.

Thus, given the large number of potential compositions taught by Yeh, and the very small chance of choosing applicant's specifically claimed combination of ingredients, there would not have been sufficient motivation for arriving at the presently claimed invention from the teachings of Yeh. This is especially true because Yeh's examples and "preferred" ingredients would lead one of skill in the art away from the claimed invention.

The Examiner has argued that it would be reasonable to expect that the fuel composition of Yeh would reduce the amount of peroxides because Yeh teaches a low sulfur fuel wherein an oxygenate and the claimed hydrocarbon additive may be present. Citing Ex parte Obiaya, the Examiner alleges that the benefit of reducing the amount of peroxides would have naturally flowed from the suggestions of Yeh.

However, for the reasons discussed above, Yeh neither teaches nor suggests the presently claimed composition. The compositions taught by Yeh do not contain both the claimed oxygenate and a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group. Instead, Yeh merely teaches a fuel composition comprising a major amount of a base fuel having no more than 50 ppm by weight of sulfur; and at least 1% by weight of an oxygenate. There is nothing in Yeh that would either suggest, or inherently result in, a reduction in peroxides. Moreover, Yeh does not teach or suggest employing a hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group in a composition having an oxygenate and the specifically claimed sulfur concentrations. Accordingly, Applicants' use of the specifically claimed hydrocarbon additive in a method to reduce peroxides in fuel compositions having sulfur concentrations of 20 ppm or that contain an oxygenate is thus not taught or suggested.

Regarding claims 10-14, 16, 17, 23-27, 29, 30, 32-36, 38-39, 41-45, 47, 48, 50-54, 56, 57 and 59, these claims recite a sulfur concentration of 8 ppm or less. According to the Examiner, it would reasonable to expect that the fuel composition meets this limitation because Yeh teaches a similar fuel with the claimed additives.

However, for a reference to inherently provide a claimed limitation, the limitation must necessarily flow from the teachings of the reference. As discussed above, Yeh does not teach or suggest the claimed composition. None of the examples of Yeh employ the claimed hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group. Accordingly, there is no evidence that the compositions of Yeh would necessarily result in the claimed peroxide concentrations. Therefore, Yeh does not inherently teach the claimed sulfur concentrations. Without some teaching or suggestion of the claimed sulfur concentration, inherent or otherwise, no *prima facie* case of obviousness exists. For this additional reason, the rejections should be withdrawn.

Regarding claim 19, directed to a hydrocarbon additive, Applicants have amended claim 19 to include the limitations of original claim 22, reciting that the additive is adapted to be combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel. Claim 22 was not rejected over Yeh or any of the other references cited by the Examiner. Accordingly, Applicants request the allowance of claim 19.

CONCLUSION

Applicant respectfully requests that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner. Applicant respectfully points out that the only amendment was to add the limitations of claim 22 to claim 19, from which it depended. Claim 22

was cancelled. Thus, no new issues have been presented which would require a further search or consideration. Therefore, the amendment should be entered.

Further, Applicant submits that the entry of the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicant submits that this claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicant therefore requests the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 50-2961.

Respectfully submitted,

Dated: December 11, 2007

By: _____
Matthew L. Whipple
Reg. No. 47,217